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EXAMINER

ROBERTSON, L.D.

ART UNIT

PAPER NUMBER

2318

7

DATE MAILED:

12/23/96

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This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

Responsive to communication(s) filed on _____

This action is FINAL.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

Claim(s) 1-60 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

Claim(s) _____ is/are allowed.

Claim(s) 1-60 is/are rejected.

Claim(s) _____ is/are objected to.

Claims _____ are subject to restriction or election requirement.

Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on _____ is/are objected to by the Examiner.

The proposed drawing correction, filed on _____ is approved disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All Some* None of the CERTIFIED copies of the priority documents have been received.

received in Application No. (Series Code/Serial Number) _____

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

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The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The drawings are objected to because of the objections noted on the PTO-948.

Correction is required.

Applicant is required to submit a proposed drawing correction in response to this Office action. However, correction of the noted defect can be deferred until the application is allowed by the examiner.

The disclosure is objected to because of the following informalities:

For completeness, applicant must fill in the missing information identifying the note related application and its status.

Additionally, note page 14, line 8, "computer 23" and "computer 20"; page 28, lines 7 and 11 (as reckoned by the line numbers in the margin), "a data field 268" and "pointer field 268"; page 30, line 11, "the 'data value' flag", etc.

Appropriate correction is required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 8-10, 16, 20-24, 27-29, 38-44, 45 and 50-56 are rejected under 35

U.S.C. 102(b) as being anticipated by Shaheen *et al.* The Shaheen reference teaches a storage system for a computer network with at least two local computers (see clients, figure 1) and at least one remote computer (see servers, figure 1), where updates are received and stored (logged), and merged (applied)(claims 1, 20, 39 & 50). The system includes local copies of the data in the clients (journal partitions) to be modified, and copies in the servers (library partitions) (claims 2, 21, 40 & 51). Further, the system teaches a “read-write replica” in non-volatile (persistent) storage (archive partition)(claims 3 & 22). The reference teaches periodic updates at scheduled intervals or scheduled times (clock intervals)(claims 4 & 23) and that updates can be event-triggered (upon the occurrence of specified events)(claims 5 & 24). The updates are stored as data objects corresponding to data items (see figures 6 and 7)(claims 8, 27, 45 & 56). The system further includes conflict resolving means (claims 9 & 28). Concurrent updates of a directory which do not refer to the same object can be merged automatically, as they are not conflicting (claims 10 & 29). Additionally, certain applications can also be provided to allow automatic conflict resolution, including bulletin boards and e-mail applications (e.g., text, lists and databases, with routine insertions and deletions)(claims 16, 38, 43, 44, 54 & 55). Further, the system provides for the elements provided in claim 20 (see the network, *per se*, figure 1). The

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memory partitioning (claims 41, 42, 52 & 53) is implied and understood, especially in view of the detail provided by applicant's specification.

Claims 6-7, 11-15, 17-19, 25-26, 30-37, 46-49 and 57-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaheen *et al.* The Shaheen reference has been discussed above. It does not teach (1) updating the files based on the number of updates or (2) the size of the local partition (claims 6, 7, 25 & 26), (3) selecting a first update over a second update according to specified criteria (claims 11 & 30); that criteria being a time-stamp or status (claims 12, 13, 31 & 32); (4) that the old version is archived when a newer version is merged (claims 14 & 36); (5) that the workstations are personal computers (claims 15 & 37); (6) that the stored files are variable length data objects (claims 17 & 33)(however, the limitations of claims 18-19 & 34-35 are inherent and implied); (7) that the partition is read-only or CD-ROM (claims 46-47 & 57-58) or (8) that the data item includes a flag indicating that the data item is appendable and that reads the data item and the previous version (claims 48-49 & 59-60). However, all of these limitations are routine practices in the art, inherent or implied by the reference, or would have been obvious for the reasons as noted below. It would have been obvious to modify the Shaheen reference to: (1) transmit updates based on the size of the local partition because the amount of storage on the local level is not infinite and may reach a limit past which information may be lost or may not be received; (2) transmit updates based on the number of transactions because of the time involved in transmitting the updates, if there are too many, they may not finish transmission in a reasonable time which may make system resource levels unacceptable for other

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tasks; (3) use some sort of criteria for the selection of prevailing updates when conflicts arise, and since selections are typically made in the computer world based on time or status it would have been obvious to use the same criteria here; (4) archive the old version when a newer version is merged since the old version will be the baseline from which the logged updates may be used to recreate any lost data, it only makes sense to archive this; (5) to have used PC's as the local computers since that was the industry practice at the time the invention was made; (6) to have permitted the files to be variable length data objects with their associated file management (e.g., not overwriting other objects, ID numbers, maps, etc.) as was common practice in the art so that files may be stored and retrieved reliably and efficiently; (7) have implemented the system taught with WORM CD-ROMs since such memory devices were readily available, reliable and economical; and (8) to include flags indicating the particular characteristics of the data, it being the standard way of keeping such information at the time of the invention. Thus the claimed subject matter would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Claims 1-60 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ecklund. The Ecklund reference appears to teach all of the particulars claimed by applicant, including a client server system with data object merging and conflict resolution. Note:

An object-oriented, distributed data base system separates into a plurality of virtual partitions following communication failure between sites accessing the data base. Each partition accesses a separate copy of an initial data base and independently updates groups of data objects included

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in the data base to add new versions of data objects to the data base. Each virtual partition maintains a copy of all previous versions of data objects and maintains a change list describing all group updates that it executes. Following restoration of communication between sites, each virtual partition merges the data bases maintained by separate partitions to form a consistent merged data base permitting versions of data objects and collections of data objects created by any one of the separate virtual partitions to be identified and accessed in the merged data base.

Additionally, note the criteria for merging:

To form the merged data base, a virtual partition first obtains the change lists maintained by the separate virtual partitions. The partition then selects a collection of group updates from among all group updates described by the change lists according to predetermined selection criteria, for example, to maximize the number of group updates in the collection. However, selection of group updates is subject to a restriction that the collection cannot include group updates described by differing change lists of the separate virtual partitions when the group updates alter the same data object path. The virtual partition then executes the collection of group updates in sequence with respect to the initial set of data objects to produce a resulting set of data objects. Finally, the partition adds additional data object versions to alternate paths of the data objects, each additional data object version resulting from group updates described by change lists other than group updates included in the collection.

As to the merging, note:

The information provided by the representative sites must be sufficient to detect missing results, to detect conflicting results, to unilaterally resolve conflicting results, and to ensure the achievement of mutual consistency in future mergers. The information to accomplish these goals is of three types: the current value of a modified item the partition tag associated with the modified item, and control or context information.

Most of the information contained in a change list is selected for inclusion based on the value of an associated partition tag. The items undergoing change in the versioned storage system are the system directory entries rather than the user data. If a client modifies and updates user data, a new version will be created; the storage system will store the new version of the user data and add new records to the system directory. If a client changes the status, accessibility, or ownership of user data, the storage system will modify an existing record in the system directory. Sites maintain mutual consistency by maintaining the mutual consistency of their system directories. Thus, in the IDHSS environment we must associate partition tags with fields in a system directory record. A field must have

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an associated partition tag if the field may be modified as the direct result of a client request and the field stores a value that must be identical on every site. An example of a field that requires an associated partition tag is the path record field which references the current instance for the path. This field is modified when a client updates the path, and each site in the current virtual partition must have the same value for this field. An example of a field that does not require an associated partition tag is the field which specifies the local representation (full copy, differenced copy, or no copy) of an instance of user data. Because the field contains strictly local information, the value will vary from site to site. It is assumed that if a system directory record contains one or more partition tags whose value is in the tag set, the entire directory record will be included in the change list. This assumption is not necessary but it is sufficient.

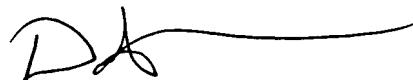
However, any deficiencies in the express teachings of Ecklund would have been obvious for the same reasons as noted in the previous rejection.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-9600.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Robertson whose telephone number is (703) 305-3825. The examiner can normally be reached Monday through Friday from 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tod Swann, can be reached at (703) 308-7791. The fax number for this group is (703) 305-9564. The fax number for art unit 2318 is 308-6606.

Communications which are not application specific may also be posted on e-mail at droberts@uspto.gov.



DAVID L. ROBERTSON
PRIMARY EXAMINER
ART UNIT 2318